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BOOK REVIEWS.

AN INTRODUCTION TO COMPARATIVE PSYCHOLOGY. By *C. Lloyd Morgan*, Principal of University College, Bristol. With Diagrams. London : Walter Scott. New York : Charles Scribner's Sons (imported). Pp. 382. Price, \$1.25.

Works of the type and spirit of Prof. C. Lloyd Morgan's *Introduction to Comparative Psychology* are rare. By its ease and vivaciousness of style, its clear singling out of the fundamental points of interest, its economy, its philosophical grasp and broad comprehensiveness, it is an exemplar of what the propædæutics of the subject should be. From a rich life, sustained by exceptional advantages and a rigorous scientific training, Professor Morgan has gathered a wealth of illustration and argument that plays with a never-failing light about his expositions. It is not the least of the merits of the book, and certainly an unfrequent trait in any work, that the author's conclusions, even where they may be allied to the results of others or have been suggested by them, are essentially the outcome of independent thought reached in connexion with independent data. For example, his experiments with newly hatched chicks and ducklings, which in themselves constitute an invaluable psychological document, form almost entirely the empirical basis of his conclusions regarding animal instinct and intelligence, association, animal sense-experience, etc. We have before us the facts that the author had, and are placed by them in immediate touch with reality. The results of Professor Morgan's inquiries are not a little enhanced by this trustworthy mode of procedure.

Two main purposes pervade the work : first, to discuss the relation of the psychology of man to that of the higher animals ; and secondly, to consider the place of consciousness in nature, the relation of psychical evolution to physical and biological evolution, in the light which comparative psychology throws on certain philosophical problems. We shall take up the second heading first, premising that the author throughout accepts evolution as the basis of his explanation of nature, including psychical nature, and that his method of interpretation is the monistic method, as that will herein be defined. In the first place, Professor Morgan's monism is resolvable into three aspects : (1) it is a monistic theory of knowledge ; (2) a monistic interpretation of nature ; and (3) analytic monism. According to the first, object and subject, cosmos and self are of co-ordinate reality ; they are the polarised

aspects of experience as explained through reason. This does not exclude but needs as its supplement a further *hypothesis*, which, in so far as it is monistic, declares that nature is explicable; that the organism both in its biological and psychological aspects is a product of evolution; that mind is not extra-natural, nor supra-natural but an *aspect* of natural existence. According to Professor Morgan's form of monistic philosophy, the evolution which sweeps through nature is characterised by three traits: (1) it is selective; (2) it is synthetic; (3) it tends from chaos to cosmos. What this means we shall see later. The third aspect of monism is termed analytic, which declares that the true reality is the man, one and indivisible; that body and mind, object and subject, are products of *analysis*, distinguishable in thought but not separable in existence.

So far, Professor Morgan has trodden the ground of purely experiential analysis. A final step, he thinks, is necessary. That selective synthesis of the cosmos which shows itself in evolution is regarded by him as the manifestation under the conditions of time and space of an underlying activity which is the ultimate cause thereof. This underlying activity is not a product of evolution; it is that in and through which evolution both of body and mind is rendered possible. In this synthesis he seems to find "the essence of the whole process, that which makes it comprehensible or rational"—the divinity that shapes the ends of the world and which there would certainly seem to be no objection to calling God, if we had the least encouragement from the author to add such an appellation. Of this underlying activity, object and subject, as we have stated before, are correlative modes of manifestation inseparably united in experience but fundamentally distinct in aspect. Now, how has this two-faced unity had its origin? This is the problem of psychology.

It would be impossible for us to reproduce the powerful and subtle steps by which we are led up in this book to the conclusions which the author adopts, and in stating here merely the bald results we must say that much of their cogency and argumentative coloring is lost. In the first place, "the Not-self is the generalised concept of all that reflexion has taught us concerning the objective aspect of the data of sense-experience; the Self is the generalised concept of all that reflexion has taught us concerning the subjective aspect of our life experience." How has that consciousness arisen which is the symbol of this Self? What is its significance, and what is its relation to the Not-self?

We seek our point of departure in the study of the correlation of psychical phenomena with physiological phenomena. A living organism, unconscious as a fertilised ovum, passes through the conventional stages of birth, conscious maturity, and death. Here again consciousness is absent. In the ovum nothing approaching to that orderly complexity of molecular vibration which we find in the brain is present, but gradually comes with the development. In this molecular vibration, the manifestation of physical energy more than structure is important. Incidentally, we have a very significant opinion of the author here, namely, that "the problem of

"development will have to be attacked in the direction rather of energy than of structure." "Life is like a vortex in a rapid stream ;—on surrounding energy it is dependent for its continued existence ; into surrounding energy it melts away. And this is true not only of individual life, but of life in its entirety."

Passing, now, to states of consciousness absent in the ovum but gradually becoming present in the matured organism, are we not forced by parity of reasoning to assume that they, too, have been developed from something more simple than consciousness, but of the same order of existence which answers subjectively to the simpler organic energy of the fertilised ovum. In other words, "as the complex molecular vibrations of the brain are to the simpler molecular vibrations of the ovum, so are the complex states of consciousness associated with the former to the simpler states of infra-consciousness, if we may so call them, associated with the latter. It is the association of consciousness and infra-consciousness with energy —its objective manifestation—that is the distinguishing feature of the view which I am endeavoring to set forth." One step remains. "We must say that all modes of energy of whatever kind, whether organic or inorganic, have their conscious or infra-conscious aspect."

Generally three answers are possible to the question, how did consciousness come to exist? The first says, it has been specially created in man or in his ancestors; the second, that it has been directly evolved from energy; and the third, which is Professor Morgan's solution, and has its roots in Spinozistic thought, that it has been evolved from infra-consciousness. Now the first answer, that of special creation, says Professor Morgan, "is in my opinion a logically tenable one, and one with which I have sincere sympathy. I do not hold it myself, because it does not seem to me either the highest or the most probable view of the matter; but if others hold it on these grounds, so let it be. With the second answer I am in distinct and direct antagonism. I do not think it has a single genuine fact of observation in its favor."

We have now to consider that *selective synthesis* of evolution of which the animate and inanimate world is the product. Looking over the development of inorganic nature, at crystals when forming, at chemical compounds when combining, and at the interruptions observable in the transitions of bodies through the solid, liquid, and gaseous states, we find in such a survey three distinctive features: "selective synthesis of a definitely determinate nature; the controlling conditions of the environment; and apparent breaches of continuity in what we may term the curve of development." Now these teachings of inorganic nature, the psychologists have interpreted in two ways. The Empiricists, laying great stress on the facts of association, do not appear to recognise an underlying law of synthesis but seem to regard consciousness as the mere spectator of a series of physiological changes in nerve-tissue. The Apperceptionists, on the other hand, regard the selective synthesis as the essential and central feature in mental development, conceding, however, "that this selective activity, to which they apply the term 'ap-

"perception," is something *sui generis*, and peculiar to mind, something which is "not found elsewhere in nature." In the reconciliation of these two views lies the gist of Professor Morgan's theory. He denies the last, but affirms the first, conclusions of both Empiricists and Apperceptionists, as above stated.

To show that this selective synthesis really exists, not as a mysterious "principle," but as a legitimate inference from the observed facts, and that it is universal or common to all known aspects of nature and nowise restricted to the realm of mind, he draws a distinction between primary or intrinsic laws of nature and secondary or extrinsic laws. The primary laws of nature are inherent, constitute the active essence of the things, are the embodiment of their freedom. Thus the tendency of carbon to unite with sulphur is due to a primary or intrinsic law; their combination is, so to speak, an act of free will. Secondary or extrinsic laws are all forms of compulsion or constraint from without. Not stopping to consider here the elucidative applications of this view to the problem of free will, we must state that that "selective synthesis which we have seen to be a factor in evolution is an "intrinsic or primary law of nature; while the conditioning effects of the environment are secondary or extrinsic laws. Both are determinate, both are essentially "natural." This selective and synthetic tendency, again, is *active*, and its activity in the monistic view is regarded "as intrinsic in, and not external to, the happenings which we call natural." It is this activity that has moulded the inorganic by natural processes into the organic, and the organic into mentality. Selective synthesis is of the very essence of mental development.

Speaking of variations—a subject which falls in with this discussion—Professor Morgan says: "I am inclined to believe that they are determinate, the definite products of selective synthesis, and that mental evolution proceeds along lines which "are determined by intrinsic laws of mind, just as a crystal is evolved along lines "which are determined by the intrinsic laws of crystallisation." We have not the space to follow out the author's interesting applications of this philosophical view to the solution of the questions of heredity, variation, and mental development, except to say that he regards the latter as not dependent on natural selection through elimination.

We now come to the central object of the work, but for us subsidiary. The discussion begins with a beautiful exposition of the wave of consciousness, elucidated by a diagrammatic interpretation, which is one of the author's favorite and most powerful helps. The wave of consciousness has its summit, crest, or focus, constituting that brief moment of luminous awareness, when a being feels itself in living contact with reality; all besides this is marginal. It is in this marginal body of the wave, in the setting of the focus, that we must seek the relatively abiding elements which link the successive phases of the wave into a continuum. For empirical psychology this wave of consciousness constitutes the mind; its moments are our sole experience. Consciousness has physiological conditions; on the hypothesis of scientific monism the curve of the physiological conditions is identical with the

curve of consciousness, the two being aspects only of one indivisible reality. Now, just as the wave of consciousness has its marginal or subconscious elements, so the curve of the physiological concomitants has its dominant and sub-dominant elements: and, as psychical states seem to exist which do not enter consciousness at all, and accordingly are called infra-conscious, their physiological correspondents may, by analogy, be termed infra-dominant. This is the nomenclature used throughout the book; it will be found to reflect much of its speculation.

We are now brought to the main question of comparative psychology, the interpretation of "other minds than ours." Professor Morgan here avails himself of an analogy. He imagines himself a chronometer, and asks what would be his mode of inquiry and what its results, if he should seek to interpret the horological mechanisms of other time-pieces, say one so low in the scale as the kitchen-clock. The upshot of the analogy is apparent. Its conclusion, which is adopted as the fundamental canon of interpretation in animal psychology, is stated thus: "In no case may we interpret an action as the outcome of the exercise of a higher psychical faculty, if it can be interpreted as the outcome of the exercise of one which stands lower in the psychological scale."

There are two kinds of suggestions, primary and secondary, due respectively to external and internal stimuli. When the first is in the focus of consciousness, we have an *impression*; when the second is there we have an *idea*. The first is presentative, the second representative. Suggestion and association are explained by showing the vast complexity and continuousness of the wave of consciousness. Association is the sole means by which experience is made available for the guidance of animal action. Here seems to lie the germ of the much-mooted "control" of consciousness. What is inherited, Professor Morgan thinks, "is the mechanism by which an association may be established; what is a matter of individual acquisition is the association that is established."

Through a discussion of Memory, which Professor Morgan takes to be entirely desultory in animals and as not due to the perception of relations; of Impressions, where we learn that the real data of experience are states of consciousness, and that sensations are results merely of psychological analysis; of Synthesis and Correlation, etc.,—we are led to the consideration of sense-experience in animals, of automatism and control, and of instinct and intelligence, in which last connexion the well-known experiments with chicks and ducklings are introduced. Here we get at the heart of Professor Morgan's views on some of the most important psychological questions. For example, of the significance of consciousness in the control of life activities. He suggests as a possibility that there may be cerebral centres for the control of the activity of the sensory centres. He says: "In automatic acts, in so far as they are accompanied by consciousness, such consciousness is a mere spectator, but in controlled activities consciousness is more than a spectator,—it takes the helm and guides." We have also a clue here to the psychological genesis in his mind of that fundamental synthesis which lies back of all evolution and is in-

herent in all being. Let us hear his own words: "Consciousness is essentially a synthetic unity, and perhaps in this synthesis we may see a subjective aspect of that universal synthetic tendency which we discern in diverse forms throughout the objective world of nature,—a synthetic tendency which is seen alike in the genesis of a raindrop, of a crystal, and of the solar system; in the exquisite structure of the frustule of a diatom, in the form and brilliancy of a humming-bird, and in the silken gold of a maiden's hair."

By *instinct* Professor Morgan understands accurate and adequate innate capacity for motor response; by intelligence he understands the power of selective control over such motor responses. Now, intelligence as thus defined, animals have, but reasoning powers, involving the perception of relations and the conceptual thought built thereon, they have not. This subject takes up several chapters and forms the climax of the discussion.

We may note here the use of a few technical terms. For Professor Morgan the perception of relations involves the focussing of the *transition* felt as the wave of consciousness passes from object to object and thought to thought. "A percept," he says, "is an impression set in a relational background"; this usage differs from that adopted in his former work, *Animal Life and Intelligence*. A concept is a percept generalised and stripped of all particularity. Three usages of the word "idea" are distinguished: (1) as a revival of impressions; (2) as a perception of a relation; and (3) as a generalised or universal concept. In the last case it is capitalised; in the second, it is italicised; and in the first, written in ordinary Roman letters.

Professor Morgan contends now that animals, although they have a dim, sub-conscious awareness of relations, yet have never focussed those relations in consciousness, so as to reach percepts. This is chiefly due to the fact that they have not the power of descriptive intercommunication, though they do have powers of indicative communication. Far less, then, have they powers of conceptual thought, the faculties of the "why" and the "therefore." Again, if animals have not the power of descriptive communication, much less have they the power of explanatory communication. If they cannot focus the *what*, still less can they focus the *because*. Here it is that the canon of interpretation, stated above as determinative, is applied with success and exactitude. Professor Morgan reduces all observed and reported observations of the reasoning powers of animals to intelligence such as he defines it. His emphasis of the importance of systematic and sustained observation as the only safe basis for conclusions concerning the intelligence of animals, as opposed to untrustworthy, anecdotal reporting, is significant of his position. He says: "I am very far from wishing to occupy the false position of dogmatic denial of rational powers to animals. I think it is a subject for further and fuller investigation. But I do express the opinion that the fuller and more careful the investigation, the less is the satisfactory evidence of processes of reasoning; and that, though the question is still an open one, the probabilities are that animals do not reason."

We are tempted to say more of some of the minor and episodic applications

of Professor Morgan's views, for they embody a wealth of suggestiveness, but we must be content with emphasising the main points. It is only left for us to state that the perusal of the book cannot be too cordially recommended.

T. J. McCORMACK.

LEHRBUCH DER ALLGEMEINEN PSYCHOLOGIE. By Dr. *Johannes Rehmke*, o. ö. Professor der Philosophie zu Greifswald. Hamburg and Leipsic : Leopold Voss. 1894. Pp. 582.

As Professor Rehmke's views on a very important question of philosophy are discussed at length in this number of *The Monist*, we may be permitted here only to indicate in rough outlines the aims of his text-book of general psychology. It is a rather large book, but does not approach to the size of the new American treatises. Its object is to throw "light on the *general* problems that the psychic life presents and to point out broadly the path which the psychological student must follow in order to arrive at scientific clearness" on these questions. One might say it is intended more for educated amateur minds than for professional students. Accordingly, it is not overloaded with detailed discussions of special psychological questions, but attacks rather popular misapprehensions and the general philosophical aspects of the subject. In psychology, the author says, it is necessary for the inquirer also to be a philosopher, which is not the case in all other special departments of knowledge. We should rather say, he is consciously a philosopher in psychology, but unconsciously and dogmatically such in the other sciences.

The book is divided into three parts : the first treating of the nature of the soul ; the second of the psychic moment or instant (*Seelen-Augenblick*) ; and the third of the psychic life. In the first, the philosophical questions come up for discussion ; in the second the technical questions, as exploited by experimental psychology ; and in the third, the questions connected with the "faculties," thought, memory, etc., and personality.

In the philosophical division the subject of the soul is first broached. All the various historical conceptions of the soul, according to Professor Rehmke, may be comprised under four general views : the ancient materialistic view of the soul as a thing ; the spiritualistic view as of an incorporeal concrete ; the modern materialistic view of the soul as a function of the brain ; and finally the Spinozistic view of the soul as a side or aspect of man. All four lead, in the author's judgment, to indefensible results. Only the "spiritualistic" view can be regarded as a hint in the right direction, but it is not a solution for it never precisely defines what that non-thingish concrete, the soul, is.

The essence and keynote of Professor Rehmke's view are contained in his definition of the abstract and the concrete, which he regards as a most sure and fruitful instrument for the analysis of the data of the world. The "abstract" is the invariable ; the "concrete" is the variable. For example, the datum of the soul is the (concrete) consciousness ; and the so-called "subject" is a *moment* of consciousness,